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Physicians' beliefs about effectiveness of cancer screening tests: A national survey of family physicians, general internists, and obstetrician–gynecologists

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ABSTRACT

Objective. To study physicians' beliefs about the effectiveness of different tests for cancer screening.

Methods. Data were examined from the *Women's Health Survey* of 1574 Family Medicine, Internal Medicine, and Obstetrics–Gynecology physicians to questions about their level of agreement about the clinical effectiveness of different tests for breast, cervical, ovarian, and colorectal cancer screening among average risk women. Data were weighted to the U.S. physician population based on the American Medical Association Masterfile. Multivariable logistic regression identified physician and practice characteristics significantly associated with physicians' beliefs.

Results. There were 1574 respondents, representing a 62% response rate. The majority of physicians agreed with the effectiveness of mammography for women aged 50–69 years, Pap tests for women aged 21–65 years, and colonoscopy for individuals aged ≥50 years. A substantial proportion of physicians believed that non-recommended tests were effective for screening (e.g., 34.4% for breast MRI and 69.1% for annual pelvic exam). Physicians typically listed their respective specialty organizations as a top influential organization for screening recommendations.

Conclusions. There were several substantial inconsistencies between physician beliefs in the effectiveness of cancer screening tests and the actual evidence of these tests' effectiveness which can lead both to underuse and overuse of cancer screening tests.

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Introduction

Prevention and early detection of cancer are the most effective ways to decrease cancer morbidity and mortality. Through appropriate cancer screening, some cancers may be prevented or detected early when treatment is most effective (Nelson et al., 2009; Preventive Services, 2008; Preventive Services Task Force (USPSTF), 1996; American College of Obstetricians and Gynecologists Committee on Practice Bulletins—Gynecology, 2009 Dec). However, not all cancers have effective screening tests, and symptom recognition may be the key to detecting some cancers early. (Baldwin et al., 2012a; Devlin et al., 2010; Goff et al., 2007; Meissner et al., 2010; Ryerson et al., 2007; Yabroff et al., 2011a) Despite these facts, there is a wide variation in cancer screening practices across the United States, resulting in both overscreening and underscreening.

Studies evaluating screening practices have shown that physicians' recommendations, along with patient barriers and beliefs, are important determinants of cancer screening (Coughlin et al., 2005; Goldzweig et al., 2004; Gorin et al., 2007; Najem et al., 1996; Ramirez et al., 2009; Rauscher et al., 2005; Schueler et al., 2008; Teng et al., 2006; Wong et al., 2010). While many studies have focused on physician knowledge, patient characteristics, and use of reminder systems to encourage screening, (Lester et al., 2009; Nadel et al., 2010; Nichols et al., 2009; Saraiya et al., 2010; Sequist et al., 2009; Werny et al., 2008; Yabroff et al., 2011b) only a few older studies have examined physician beliefs about the effectiveness of tests for cancer screening, and these studies have typically occurred in small, defined geographical areas (Clasen et al., 1994; Cummings et al., 1984).

In an attempt to minimize variation and increase the use of appropriate cancer screening tests, evidence-based guidelines targeted to health care providers have been developed. This is an important strategy, as patients have consistently reported that a physician

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recommendation is one of the most important influences on their decision to complete cancer screening tests (Goldzweig et al., 2004; Schueler et al., 2008). A previous review reported that physicians' lack of agreement with recommendations serves as a barrier to guideline adherence (Cabana et al., 1999 Oct 20). Understanding physician beliefs about the effectiveness of cancer screening tests is an essential step in ensuring that patients receive evidence-based cancer screening.

In this study, data from *Women's Health Survey* sent to a nationally representative sample of family medicine (FM), general internal medicine (IM), and obstetrics–gynecology (Ob/Gyn) physicians were used to examine their beliefs about the effectiveness of different tests to screen for breast, cervical, colorectal (CRC), and ovarian cancer among average risk women. The findings from this study can help guide the development of interventions to educate physicians about the effectiveness of cancer screening tests and ultimately to improve the appropriate use of these tests.

Methods

Study sample

The study sample included 3200 U.S. physicians aged 64 years and younger practicing in office or hospital settings. Equal numbers of FM, IM, and Ob/Gyn physicians were selected by stratified random sampling from the American Medical Association (AMA) Physician Masterfile. Physicians aged 65 years and older were excluded to ensure a sample of physicians most likely to be in active clinical practice.

Survey instrument and administration

A 12-page mail survey examining physicians' agreement with clinical effectiveness of cancer screening tests for breast, cervical, colorectal, and ovarian cancers; reported care for women's health through vignettes about preventive care services, specialty referral, and patient risk assessment; attitudes towards taking risks; sources of information about cancer screening; and personal cancer experience was administered November 2008–January 2009. The questionnaire also captured physician demographics and practice characteristics. Detailed descriptions of the survey and its administration have previously been reported (Baldwin et al., 2012b; Goff et al., 2011a,b; Trivers et al., 2011). Institutional Review Board approval was obtained from the University of Washington and the Centers for Disease Control and Prevention.

Variables of interest

For this study, we examined the question that asked physicians about their level of agreement (strongly disagree, disagree, agree, and strongly agree) with statements that various tests were clinically effective in screening for breast, cervical, ovarian, and CRC in the average risk population. We defined belief in the clinical effectiveness of a test for cancer screening if the physician responded "agree" or "strongly agree" with the statement. The tests for breast cancer screening included mammography for women aged 40–49 years, mammography for women aged 50–69 years, breast magnetic resonance imaging (MRI), and clinical breast examination (CBE); cervical cancer screening included human papillomavirus (HPV) test without Papanicolaou (Pap) test for women aged 30–65 years (primary HPV screening) and Pap test for those aged 21–65 years; ovarian cancer screening included cancer antigen 125 (CA-125) testing, transvaginal ultrasound (TVU), and annual pelvic examination; and CRC screening included colonoscopy, computed tomography (CT) colonography, sigmoidoscopy, and take-home fecal occult blood test (FOBT).

Physician characteristics (age, specialty, sex, board certification, years in practice, group versus solo practice, weekly average number of patients, involvement in clinical teaching, personal experience with cancer, geographic location, census division, level of risk-taking, and fear of malpractice) were examined as factors that might predict physicians' belief in the effectiveness of each test for cancer screening. Since beliefs may be related to where and from whom a physician receives cancer screening information, we also assessed which professional organizations influenced their cancer screening recommendations.

Statistical analysis

Initial physician exclusions from the 3200 study sample included 33 duplicates; 95 undeliverables; 19 retired, disabled, or deceased; and 11 not practicing or on leave. Of the remaining 3042 physicians who were mailed surveys, 1878 (61.7%) responded. Further exclusions were 200 respondents reporting not providing outpatient care to women; 71 working in settings not providing outpatient/primary care (e.g., emergency rooms); 10 reporting specialties other than FM, IM, and Ob/Gyn; and 23 in residency or fellowship training. The final sample included 1574 respondents. Responses were weighted to their representative number in the practicing U.S. physician population by medical specialty using AMA Physician Masterfile counts proportionately.

Stepwise multivariable logistic regression analysis identified the physician and practice characteristics that were independently and significantly associated with belief in the effectiveness of each test for cancer screening at the $p \leq 0.05$ level. The characteristics entered into the regression analysis were those significantly associated with belief in the test effectiveness for cancer screening in an unadjusted analysis. Only organizations that make recommendations on a specific type of cancer were included in that regression model, such as the use of the U.S. Preventive Services Task Force (USPSTF) and the American Cancer Society (ACS) for all four cancers and use of the American Congress of Obstetricians and Gynecologists (ACOG) for breast, cervical, and ovarian cancers. All analyses were conducted using SUDAAN 10.0 (RTI International, Research Triangle Park, NC). Because belief in the effectiveness of cancer screening tests was a common outcome, risk ratios within SUDAAN based on predicted marginals were calculated (Bieler et al., 2010).

Results

In the weighted study sample, 41.5% were FM, 41.0% IM, and 17.5% Ob/Gyn physicians (Table 1). Almost half (42.7%) of physicians were aged 50–64 years, 71.1% were Caucasian, and 40.4% were female. In addition, 91.6% were board certified and 82.0% had been in practice for more than 10 years.

Influential organizations for cancer screening recommendations

Most physicians ranked their respective specialty professional organization as one of the top organizations that influenced their cancer screening recommendations (Table 2). Across all three specialties, the majority of physicians reported the ACS as a top influential organization. More than half of FM and IM physicians reported the USPSTF, and almost half of the Ob/Gyn physicians ranked the National Institutes of Health/National Cancer Institute (NCI) as one of their top influential organizations.

Breast cancer

For breast cancer screening, half of the physicians strongly agreed and slightly less than half agreed that mammography is an effective test for women aged 40–49 years (Table 3). For women aged 50–69 years, 81.7% of physicians strongly agreed that mammography is an effective screening test for breast cancer. Large percentages of physicians also either strongly agreed (40.0%) or agreed (45.4%) that the CBE is an effective screening test. Over one-third of physicians agreed that MRI is an effective screening test for average risk women.

In the adjusted analysis (Table 4), physicians who listed the ACS as one of their top influential organizations were significantly more likely to believe that mammography is an effective cancer screening test for women aged 40–49 years, whereas physicians listing the USPSTF as a top influential organization were less likely to believe this test is effective. Physicians who reported a personal cancer experience were less likely to believe that mammography is effective for women aged 50–69 years. Physicians who were involved in clinical teaching or who listed USPSTF as an influential organization were significantly less likely to believe that the CBE is an effective screening test.